S.Q. DUAL CONTROL PENTODE

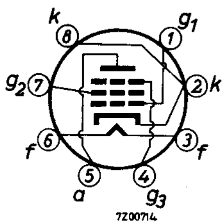
Special quality dual control pentode designed for use as amplifier and mixer.

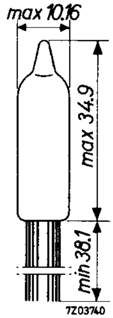
QUICK REFERENCE DATA			
Life test	1000 hours		
Mechanical quality	Shock and vibration resistant		
Base	Subminiature		
Heating	Indirect		
	A.C. or D.C.; Parallel supply		
Heater voltage	V_f	6.3	V
Heater current	I_f	150	mA
Mutual conductance anode to grid No.1	S_{ag_1}	3.2	mA/V
Mutual conductance anode to grid No.3	S_{ag_3}	0.5	mA/V

DIMENSIONS AND CONNECTIONS

Base: Subminiature

Dimensions in mm





Connections should not be soldered nearer than 5 mm to the seal.

Leads should not be bent nearer than 1.5 mm to the seal.

CHARACTERISTICS

Column I Nominal value or setting of the tube
II Range values for equipment design: Initial spread
III Range values for equipment design: End of life

		I	II	III	
Heater voltage	V_f	6.3			V
Heater current	I_f	150	140 - 160		mA
Anode voltage	V_a	100			V
Grid No.2 voltage	V_{g2}	100			V
Grid No.3 voltage	V_{g3}	0			V
Cathode resistor	R_k	150			Ω
Anode current	I_a	5.3	3.7 - 6.9		mA
Grid No.2 current	I_{g2}	4.0	2.8 - 5.4		mA
Mutual conductance;					
anode to grid No.1	S_{ag1}	3.2	2.7 - 4.0	ΔS : max. 20 %	mA/V
anode to grid No.3	S_{ag3}	0.5			mA/V
Internal resistance	R_i	110			kΩ
Negative grid No.1 current	$-I_{g1}$		max. 0.3	max. 1.0	μA
Grid No.1 resistor R_{g1} = 1 MΩ					
Anode voltage	V_a	100			V
Grid No.2 voltage	V_{g2}	100			V
Grid No.3 voltage	V_{g3}	-1			V
Cathode resistor	R_k	150			Ω
Anode current	I_a	4.0			mA
Grid No.2 current	I_{g2}	5.8			mA
Mutual conductance;					
anode to grid No.1	S_{ag1}	1.95			mA/V
anode to grid No.3	S_{ag3}		0.5 - 1,8		mA/V
Internal resistance	R_i	50			kΩ

CHARACTERISTICS (continued)

		I	II	III	
Grid No. 1 cut-off voltage	$-V_{g_1}$		max. 7.5		V
Anode voltage	V_a	100			V
Grid No. 2 voltage	V_{g_2}	100			V
Anode current	I_a	100			μA
Grid No. 3 cut-off voltage	$-V_{g_3}$		max. 8.0		V
Anode voltage	V_a	100			V
Grid No. 2 voltage	V_{g_2}	100			V
Anode current	I_a	100			μA
Leakage current between cathode and heater	I_{kf}		max. 5	max. 10	μA
Voltage between cathode and heater V_{kf} = 100 V					
Insulation resistance between two electrodes	R_{ins}		min. 100	min. 50	MΩ
Voltage between electrodes = 100 V					
Vibrational noise output	V_o		max. 40		mV
Anode supply voltage	V_{ba}	100			V
Anode resistor	R_a	10			kΩ
Grid No. 2 voltage	V_{g_2}	100			V
Grid No. 3 voltage	V_{g_3}	0			V
Cathode by pass capacitor C = 1000 μF					
Cathode resistor R_k = 150 Ω					
Vibration frequency 40 Hz					
Acceleration 15 g					

CAPACITANCES; With external shield

		I	II	
Grid No.1 to grid No.2, grid No.3, cathode and heater	C_{g_1/g_2g_3kf}	4.0	3.5 - 4.5	pF
Grid No.3 to grid No.1, grid No.2, cathode and heater	C_{g_3/g_2g_1kf}	4.0	3.5 - 4.5	pF
Anode to grid No.2, grid No.3, cathode and heater	C_{a/g_2g_3kf}	3.4	2.9 - 3.9	pF
Anode to grid No.1	C_{ag_1}		max.0.02	pF
Anode to grid No.3	C_{ag_3}		max. 1.1	pF
Grid No.1 to grid No.3	$C_{g_1g_3}$		max.0.15	pF

SHOCK AND VIBRATION RESISTANCE

The following test conditions are applied to ascess the mechanical quality of the tube. These conditions are not intended to be used as normal operating conditions.

Shock

The tube is subjected 5 times in each of 4 positions to an acceleration of 500 g supplied by an NRL shock machine with the hammer lifted over an angle of 30°.

Vibration

The tube is subjected during 32 hours in each of 3 positions to a vibration frequency of 25 Hz with an acceleration of 2.5 g.

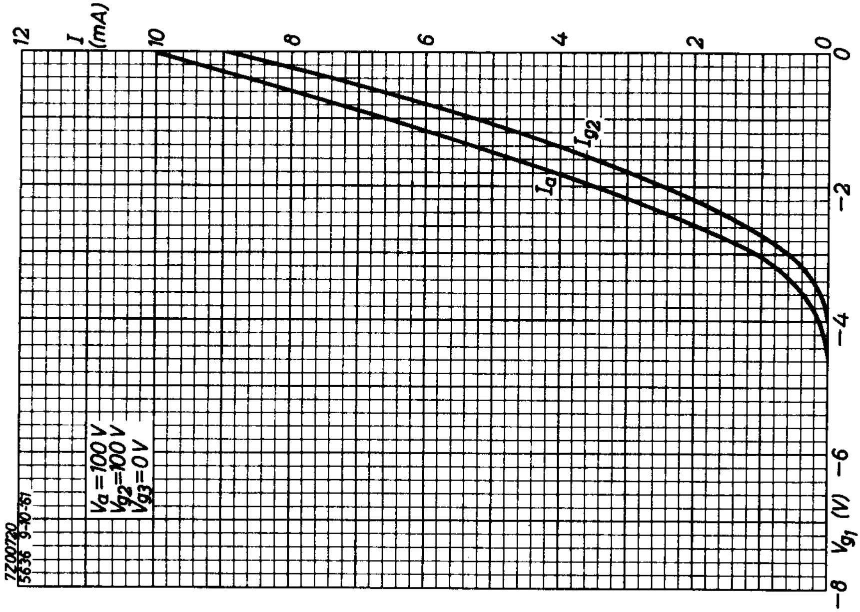
LIFE

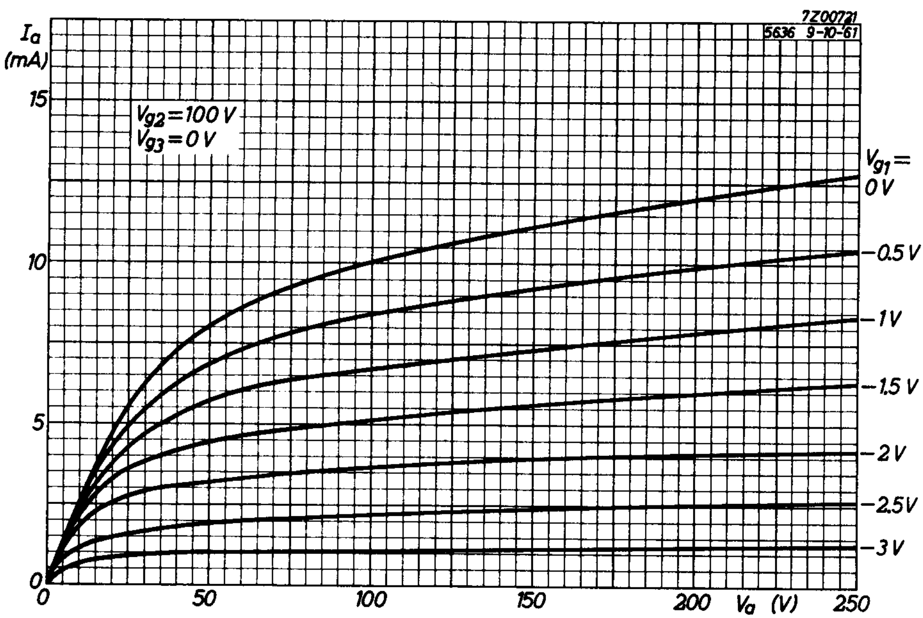
Production samples are tested to be within the end of life values (column III) during 1000 hours.

LIMITING VALUES (Absolute max. rating system)

Anode voltage	V_{a_o}	max.	330	V
Anode voltage	V_a	max.	165	V
Anode dissipation	W_a	max.	1.1	W
Grid No.3 voltage	V_{g_3}	max.	30	V
Grid No.3 negative voltage	$-V_{g_3}$	max.	55	V
Grid No.2 voltage	V_{g_2}	max.	155	V
Grid No.2 dissipation	W_{g_2}	max.	0.7	W
Grid No.1 voltage	V_{g_1}	max.	0	V
Grid No.1 negative voltage	$-V_{g_1}$	max.	55	V
Grid No.1 resistor	R_{g_1}	max.	1.2	MΩ
Cathode current	I_k	max.	16	mA
Voltage between cathode and heater;				
D.C. component	V_{kf}	max.	200	V
peak value	V_{kf_p}	max.	200	V
Bulb temperature	t_{bulb}	max.	220	°C

Heater voltage: The average heater voltage should be 6.3 V.
Variations of the heater voltage exceeding the range of 6.0 V to 6.6. V will shorten the tube life.
The tolerance of heater current (column II) should be taken into account.


I (mA)
12
10
8
6
4
2
0
0
−2
−4
−6
−8
V_{g1} (V)
I_{g2}
I_a
V_a=100 V
V_{g2}=100 V
V_{g3}=0 V
7Z00720
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I_a (mA)
15
10
5
0
0
50
100
150
200
250
V_a (V)
V_{g2}=100 V
V_{g3}=0 V
7Z00721
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V_{g1}= 0 V
−0.5 V
−1 V
−1.5 V
−2 V
−2.5 V
−3 V

PHILIPS

Data handbook

Electronic components and materials

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